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ADDITIONS TO THE FLORA OF WESTERN OREGON DURING 1919

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It has been possible to continue the examination of our flora during the past season along the lines suggested in my previous notes (*Torreya* 18: 21-35; *ib.* 220-226. 1918). It was pointed out at that time (1) that the boundaries established in Piper & Beattie's *Flora of the Northwest Coast* were very easily crossed by indigenous species of adjacent range; (2) that our climate and soil are so favorable to the introduction and spread of foreign species that a steady increase in our plant-population may be expected from this source. The following notes on the collections of the past season may serve to verify both of these propositions. In the matter of native species, I was able to study three regions which may be regarded as natural avenues of ingress. One of these was the Calapooia Range along the southern boundary of Lane County, which was selected by Piper and Beattie as marking the southern limit of their *Flora*. I had ventured the assertion (*Torreya* 18 : 23) that this seemed a very slight barrier to interpose to the northward extension of the Californian flora. But I had not at that time visited the region, and knew nothing of its topography in detail. In June of the present year (1919), I made my headquarters at Cottage Grove, within two hours' walk of the Calapooias, and worked along the range for a total distance of some thirty miles east and west. I found it of very moderate elevation, the highest summit visited reaching only 2,200 feet, and pierced by two main arteries of travel, the Southern Pacific Railway and the Pacific Highway, not to mention many minor roads and innumerable trails. Just where the

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authors of the Flora meant to draw their boundary-line I was unable to determine; perhaps, like myself, they were misled by the map, on which the Calapooia Range appears as a single well-defined ridge. As a matter of fact, it is a complex of mountains and valleys at least ten miles in breadth, flanked by foothills on both sides, but with a somewhat more abrupt approach on the north than on the south. To draw a botanical boundary-line under such circumstances would be most difficult, for any plant that succeeded in finding its way into the range would have little trouble in advancing into the more open country to the north. There are no summits above snow-line to be crossed, no streams of any considerable width, no barren areas, no zones of continuous cultivation, no appreciable change of climate—in fact, the casual collector would never dream, from any outward indications, that he was approaching anything as momentous as a botanical boundary. It is not surprising therefore that several species were collected during this trip which find no mention in the pages of the Flora of the Northwest Coast.

After this hasty survey of the southern boundary, it seemed in order to visit the eastern one, and try to determine to what extent the Cascades have barred the way to the flora of Eastern Oregon. Here is a real mountain barrier, often rising far above snowline, pierced by few avenues of travel, and with very diverse climatic conditions on the two faces. The point of attack was Mount Jefferson, on the eastern line of Linn County—a precipitous volcanic peak, 10,500 feet in height, and so steep that only a veteran Alpinist can hope to reach the summit. Much of the west slope is too sheer for trees to get more than a precarious foothold, and a large part of the region has in addition been swept by forest-fires, so that an aridity prevails in many places which would not ordinarily be expected on the western side of the Cascades. It was not surprising, in an environment so similar to the semi-arid region of central Oregon, to encounter species which have been thought to belong only to the eastern division of the state.

Our *western* boundary, consisting of the Pacific Ocean, could not be expected to afford an avenue for any introductions except

such as were frankly indebted to human agency for their transportation; but the *northern* boundary of the State, although not the northern boundary of the Flora of the Northwest Coast, seemed worth some study. Along the sand-bars of the Columbia and on its low muddy shores is a surprising aggregation of species that have either been brought down by the river from their inland range, or have found lodgment in some unexplained way after wider wanderings. The number of these unexpected strangers will be evident after a study of the following list.

In addition to these penetrations of the frontier by indigenous species, the influx of foreign forms has been found to continue unabated. Just where they come from it is usually quite impossible to determine; they were not here yesterday, but to-day we find them, and to-morrow, so favorable are our soil and climate, we can be reasonably certain that they will still be here. Not only is this true in the centers of population, but very often our first encounter with these new plants is in some remote country district or along some mountain stream. No species has been included in the following list that was not growing spontaneously and with a good chance of perpetuating itself indefinitely. Every one of these species was collected within the Oregon limits of the Flora of the Northwest Coast, and is understood to be without mention in that work. Specimens of each have been deposited in the Gray Herbarium, and I must again express my indebtedness to Mr. J. Francis Macbride for his unwearying kindness in revising and correcting my attempts at determination, as well as in clearing up many knotty problems of nomenclature and specific limits. Species that are clearly introduced are marked with an asterisk(*). A number of these were originally reported in my list of Linnton ballast-plants (*Torrey* 17: 151-160). At the time they did not seem sufficiently stable to be worthy of inclusion in a list of established species; but, although the area was occupied by a shipyard during the war, and the vegetation upon it consequently subjected to a very rigorous test (most of the ground being excavated or planked over, covered with piles of material and machinery, and tramped over daily by hundreds of men and horses), I was delighted to find that several species

had survived all these vicissitudes, and were still flourishing on the occasion of my last visit in August, 1919. I feel therefore that they have earned their right to be regarded as permanent members of our flora, and they are included in the following list.

1. *Azolla caroliniana* Willd. In shallow water at the west end of Oswego Lake, Clackamas County. Also reported by Gorman from Oak Grove in the same county.
2. *Equisetum fluviatile* L. var. *polystachyum* (C. Brückn.) A. A. Eaton. With the species in a marsh at the east end of Pamela Lake, at the southwest base of Mt. Jefferson. Apparently has been found but once before in this country, by Flett at Tacoma, Wash.
3. **Digitaria sanguinalis* (L.) Scop. On site of old stable, Salem.
4. **Setaria glauca* (L.) Beauv. In waste ground on river-bank, Salem.
5. **Ammophila arenaria* (L.) Link. In shipyard on old ballast, Linnton, Portland.
6. **Aspris capillaris* (Host.) Hitchc. Beginning to appear in many places, but first collected on a sand-bar in the North Santiam River at N. Santiam Station, Marion County.
7. *Eragrostis caroliniana* (Spreng.) Scribn. On a sand-bar in the Columbia on Hayden Island, opposite Vancouver, Wash. Has been reported from southeastern Oregon, and common in the Middle West.
8. **Bromus brizaeformis* F. & M. In shipyard, Linnton. Very common east of the Cascades.
9. **Agropyron junceum* (L.) Beauv. With the last. A species of northern Europe.
10. **Secale cereale* L. A frequent escape in railroad yards, Lower Albina, Portland.
11. *Scirpus pauciflorus* Lightf. In mountain meadow in Hunt's Cove, three miles south of Mt. Jefferson—altitude 6,000 feet.
12. *Carex brachypoda* Holm. With the last.
13. *Carex ormantha* (Fernald) Mackenzie. With the last.
14. *Allium attenuifolium* Kellogg. Not uncommon in dry soil about Salem.

15. *Salix lasiolepis* Benth. var. *Bigelovii* Bebb. In low ground along Mill Creek, Turner. Det. by Camillo Schneider.
16. *Salix lasiandra* Benth. var. *lancifolia* Anderss. Rather frequent along streams and borders of ponds. Det. by C. Schneider.
17. **Polygonum prolificum* (Small) Robinson. Sandy soil in railroad yards, Lower Albina, Portland.
18. **Polygonum polystachyum* Wall. Dry roadside near State Fair Ground, Salem; also about old barn at Wheatland, Yamhill County. A native of the Himalayas and Afghanistan.
19. **Fagopyrum esculentum* Moench. Along railroad tracks, Silverton.
20. **Roubieva multifida* (L.) Moq. In shipyard, Linnton, and abundant in waste ground at Lower Albina.
21. **Atriplex patula* L. var. *hastata* (L.) Gray. Abundant on rubbish heaps and in waste ground at State Fair Ground, Salem.
22. *Spergularia salsuginea* Fenzl var. *bracteata* Robinson. Mud-flats along the Columbia on Hayden Island.
23. **Lychnis alba* Mill. On sand-bars in North Santiam River, and in grain fields at Salem.
24. **Silene pendula* L. In an abandoned garden, Salem.
25. **Dianthus barbatus* L. Shady roadside near Marion, Marion County.
26. *Thalictrum polycarpum* Wats. Not infrequent in low ground in the Willamette Valley.
27. **Nigella damascena* L. In waste ground and vacant lots, Salem.
28. *Delphinium leucophaeum* Greene. On rocky cliffs about Oswego Lake, and along the Willamette River at Elk Rock. Apparently a distinct species.
29. **Glaucium flavum* Crantz. In ship-yard on old ballast, Linnton.
30. **Lepidium virginicum* L. With the last.
31. **Brassica incana* Tenore. With the last.
32. **Diplotaxis tenuifolia* (L.) DC. With the last; also in railroad yards at Lower Albina.

33. *Roripa sylvestris* (L.) Bess. Dry soil along streets, Salem.
34. *Roripa lyrata* (Nutt.) Greene. Muddy shores of Pamela Lake, Mt. Jefferson.
35. *Cardamine Lyallii* Wats. About a spring on mountain-side, in Hunt's Cove, Mt. Jefferson region.
36. **Arabis alpina* L. Common in cultivation at Salem, and escaping freely to garden-borders and street-parking.
37. **Reseda lutea* L. In shipyard, Linnton.
38. **Reseda Luteola* L. With the last; also in railroad-yards, Lower Albina.
39. *Cotyledon oregonensis* Wats. On dry rocky slope, three miles south of Mt. Jefferson.
40. *Saxifraga arguta* Don. In boggy soil on mountain-side, Hunt's Cove, Mt. Jefferson region.
41. *Saxifraga saximontana* E. Nels. On wet cliffs, Oswego Lake and Elk Rock.
42. *Saxifraga fragosa* Suksd. Low woods along Mill Creek, Turner.
43. *Potentilla Drummondii* Lehm. Mountain-meadow in Hunt's Cove, Mt. Jefferson region.
44. **Potentilla rivalis* Nutt. On rubbish about city dump, Portland. Reported by Gorman from Columbia Beach.
45. **Rubus illecebrosus* Focke. A Japanese species, stubbornly persisting after cultivation in a garden at Salem, and almost impossible to eradicate.
46. **Cytisus multiflorus* (Ait.) Sweet. Common in cultivation about Portland, and well established in a dry pasture three miles east of Tualatin, Washington County.
47. **Melilotus officinalis* (L.) Lam. Common in waste ground about Portland.
48. **Lotus corniculatus* L. In shipyard, Linnton.
49. **Ononis arvensis* L. With the last.
50. **Lathyrus hirsutus* L. On vacant lots and street-parking, Salem; also reported by Sheldon from Portland.
51. **Lathyrus sphaericus* Retz. In dry soil on neglected street-parking, Salem.
52. **Euphorbia Helioscopia* L. On rocky shore of the Willamette, Lower Albina, Portland.

53. **Tilia europaea* L. Thoroughly established at border of woods by roadside, Gunter, Douglas Co., in the Calapooias.
54. *Sidalcea Nelsoniana* Piper. Not uncommon in dry ground about Salem. This is the "apparently undescribed species" of my list in *Torreyia* (18 : 28. No. 90).
55. **Althaea rosea* Cav. A common escape to vacant lots and waste ground, Salem.
56. **Viola odorata* L. Escaping to cultivated ground about Salem. This is the form with white *single* flowers.
57. *Viola orbiculata* Geyer. Dry woods near timber-line on Mt. Jefferson. Previously collected in this region by Gorman.
58. **Oenothera mollissima* L. In shipyard, Linnton. An Argentinian species.
59. *Sphaerostigma andinum* (Nutt.) Walp. On muddy shore of the Columbia on Hayden Island.
60. *Clarkia rhomboidea* Dougl. Dry woodland on Parrott Mountain, three miles northeast of Newberg.
61. *Lomatium microcarpum* (Howell) C. & R. On a rocky ridge in the Calapooias, two miles northeast of Comstock, Douglas County. Perhaps the first report since its discovery at Roseburg.
62. *Arctostaphylos patula* Greene. Dry slope of Mt. Jefferson, above Pamela Lake.
63. **Asclepias syriaca* L. On vacant lots and street-parking, Salem.
64. *Phacelia californica* Cham. Dry soil along railroad, Cottage Grove. This is Macbride's forma *vincens* (*Contr. Gray Herb.* 49: 37. 1917); but as no such present participle seems to occur in the Latin language, and it was evidently Mr. Macbride's intention to use a form of *vincire*, to bind or twine, it would not seem a violation of the International Rules to substitute the form *vinciens*, and the correction is accordingly proposed.
65. *Phacelia Bolanderi* Gray. Rocky slope along the Pacific Highway in the Calapooias, one mile south of Divide, Lane County.

66. *Phacelia nemoralis* Greene var. *mutabilis* (Greene) Macbr.
Very common in dry soil—perhaps the only form of this species in the Willamette Valley.
67. *Cryptantha Hendersonii* (Nels.) Piper. Not infrequent in rocky woods, especially near Portland.
68. **Omphalodes linifolia* (L.) Moench. Beginning to escape to street-parking, Salem.
69. *Verbena prostrata* R. Br. Dry soil along the railroad, in the Calapooias, three miles south of Divide.
70. **Solanum rostratum* Dunal. In railroad yards, Lower Albina.
71. **Solanum sisymbriifolium* Lam. In shipyard, Linnton.
72. *Linaria texana* Scheele. On a rocky ridge in the Calapooias, two miles northeast of Comstock, Douglas County.
73. **Plantago major* L. var. *intermedia* (Gilib.) DCne. Not infrequent on muddy shores about Salem.
74. **Galium Mollugo* L. Frequent on lawns in Salem.
75. **Centranthus ruber* DC. Often persisting in yards, Salem.
76. **Echinocystis lobata* (Michx.) T. & G. In thickets along Mill Creek, Salem.
77. *Erigeron confinis* Howell. On dry rocky slope of Mt. Jefferson. This seems very close to *E. aequifolius* Hall, a species of the Sierra Nevada, and closer study is needed.
78. **Ambrosia psilostachya* DC. In railroad yards, Lower Albina.
79. *Franseria acanthicarpa* (Hook.) Cov. Sand-bar on Hayden Island.
80. **Xanthium oviforme* Wallr. With the last. A native of the Orient, which has probably been confused in the West with *X. speciosum* Kearn.
81. *Rudbeckia occidentalis* Nutt. Dry soil along roadside in the Calapooias, a half-mile south of Divide. Also reported by Gorman from the Three Sisters.
82. **Matricaria inodora* L. In shipyard, Linnton.
83. **Artemisia vulgaris* L. With the last; and also in railroad yards, Lower Albina.
84. **Artemisia annua* L. In railroad yards, Lower Albina.
85. *Artemisia ludoviciana* Nutt. On sand-bars in the North

Santiam River; and also along the shores of the Columbia near Portland.

86. *Cacaliopsis Nardosmia* Gray. In open woods on the summit of a ridge in the Calapooias, seven miles northwest of Drain, Douglas County.
87. **Carduus nutans* L. In shipyard, Linnton.
88. **Cirsium arvense* (L.) Scop. var. *vestitum* Wimm. & Grab. With the last.
89. **Centaurea Calcitrapa* L. With the last.
90. **Hieracium Pilosella* L. Abundant in a lawn at Salem, threatening to become a formidable pest, as it is most difficult to eradicate.

This list brings the total of species added to the flora of Western Oregon since these studies were begun to 309. As the number listed in the Flora of the Northwest Coast is 1617, it will be observed that the authors of that work failed to mention about sixteen per cent. of the total number of species in their territory. In other words, the student who depended wholly on their manual would fail to determine about every seventh species which he encountered—a margin of possible error much too large to be comfortable.

Whether this state of uncertainty will be relieved by the next manual due to appear in this district—Professor Abrams' Illustrated Flora of the Pacific Coast, the first volume of which is understood to go to press about the first of the year—still remains on the lap of the gods. The Oregon botanists realize that a close personal survey of their territory yet remains to be made; and as the value of "absent treatment" as applied to the preparation of a flora is somewhat open to question, it is within the bounds of possibility that these local supplementary lists may still be not wholly valueless after several more of these "comprehensive" manuals have come and gone!